PCMCIA STANDARD MEMORY CARD FRAME

FIELD OF THE INVENTION

The present invention relates generally to memory media and I/O device containers, and more particularly to a packaging container for printed circuit boards that conforms to standards set by PCMCIA, JEDIC, ISO, etc. for peripheral devices.

BACKGROUND OF THE INVENTION

Current technology computing devices are so small that there is very little room for storage devices such as a hard disk drive or I/O device. In order to expand a portable, laptop, or any other type of computer's capacity and functioning capability, manufacturers have devised "plug-in" peripheral cards in the form of printed circuit boards (PCB's) contained within an exterior package. These devices are termed "PCMCIA style peripheral devices".

The PCMCIA style devices can be used to perform the functions of software, resident memory in hardware devices, or in the place of a hard drive. The cards can be used as flash memory, to facilitate LAN networking, paging devices, and as FAX modems. They may be used in cellular telephones, PROMS, EPROMS, EEPROMS, RAMS, SRAMS, and DRAMS. In short, the cards are very versatile as well as inexpensive.

Due to the myriad methods possible to construct the interface of the memory card with the computer, the Personal Computer Memory Card International Association (PCMCIA) and comparable organizations have established certain standards for the construction of the memory cards within their containers.

Use constraints require that a PCB be sealed within a rigid package for insertion into the PC. One problem in the current art methods of fixing the card in metallic containers is that adhesives, solvents and/or epoxies are generally used to secure the two halves of the container. Since the bonding requires the adhesion of two dissimilar metals, current art processes can lead to functional problems with the card, as well as to failures of the bond.

Another disadvantage is that current art constructions use many components, leading to greater manufacturing cost, and a higher likelihood of failures.

OBJECTS, SUMMARY, AND ADVANTAGES OF THE INVENTION

Accordingly, it is an object of the present invention to provide a PCMCIA style peripheral device container that meets PCMCIA, JEDIC, and ISO standards. It is a further object of the present invention to provide a container that comprises few components to reduce manufacturing cost.

The present invention is a container for a peripheral device and the process by which the container is manufactured. The container comprises chiefly two stamped metal covers, (an upper and a lower cover half), each secured to a plastic frame element. The cover halves are secured by extended fingers which wrap around the plastic frame. This provides a double layer of metal at the perimeter of the frame.

The two cover halves are situated so as to encapsulate the subject PCB and to affix it in its proper position. The two cover halves are then welded together using sonic welding on the plastic frame or resistance welding on the covers. The frame has been designed to meet all

PCMCIA standards, including but not limited to polarizing keys and grounding points.

Advantages of the present invention are as follows:

1. Joinder of the two package halves is accomplished without the use of adhesives. This leads to greater reliability of the memory card.
2. Very few components are used, minimizing manufacturing costs.
3. More space for the PCB is available within a given package volume.
4. The present invention provides a memory card container that is stronger than prior art containers.
5. The device constructed according to the present invention lends itself to automated assembly.
6. The device of the present invention is very versatile, and can be used for types I, II, III, and IV boards. It is envisioned that future board designs will also be compatible with the present invention.
7. The process will allow a card manufacturer to bond only similar materials, plastic to plastic, since the bonding of the dissimilar materials, plastic to metal, is accomplished by the package manufacturer.
8. Application of a non-conductive layer to the two cover halves prior to stamping allows the package to have a non-conductive interior.
9. The design allows the PCB to be fixed in place by opposing plastic elements ("bosses") at any level within the package.
10. The PCB connectors and/or other I/O devices can be clamped between the cover halves.
11. Overall package thickness can be controlled to a very strict tolerance.
12. The package provides variable grounding locations along the length of the package sides.

These and other objects and advantages of the present invention will become apparent to those skilled in the art in view of the description of the best presently known mode of carrying out the invention as described herein and as illustrated in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective exploded view of the metal covers and plastic frame of the package of the present invention;

FIG. 2 is a detail view of the plastic frame showing the energy director utilized in the sonic welding process;

FIG. 3 is an exploded front end view of the metal package covers and plastic frame;

FIG. 4 is side cross-sectional view of a memory card and container as embodied by the present invention.

BEST MODE OF CARRYING OUT THE INVENTION

The present invention is a PCMCIA style peripheral device package 10. Referring to FIG. 1, it can be seen that the package 10 comprises chiefly an upper cover 12, a lower cover 14, an upper frame element 16, and a lower frame element 18. The covers 12 & 14 are formed from stamped metal, and the frame elements 16 & 18 are molded plastic.

While the material for the covers is chosen to be stamped metal, there is no requirement that it be so. Any rigid material will suffice. However, if the cover is of a conductive material, it will serve to reduce EMI, RF and ESD problems, these being factors which elec-